BUDGET ACTIVITY: 01
PROGRAM ELEMENT: 0601103N
PROGRAM ELEMENT TITLE: UNIVERSITY RESEARCH INITIATIVES

COST: (Dollars in Thousands)

Project Number & Title	FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
UNIVERSITY RESEARCH INITIATIVES	88,921	91,310	75,910	72,905	75,655	77,087	78,703	80,354

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program includes support for multidisciplinary basic research, in a wide range of scientific and engineering disciplines that are important for maintaining the technological superiority of the U.S. Navy, and for university research infrastructure, by acquiring research instrumentation needed to maintain and improve the quality of university research important to the Navy. Multidisciplinary research efforts involve teams of researchers investigating high priority topics that intersect more than one traditional technical discipline. For many military problems, this multidisciplinary approach serves to stimulate innovations, accelerate research progress and expedite transition of results to Naval applications. The Defense University Research Instrumentation Program (DURIP) supports university research infrastructure essential to high quality Navy relevant research. The instrumentation program complements other Navy research programs by supporting the purchase of high cost research instrumentation that is necessary to carry out cutting-edge research. In addition, the program also supports Presidential Early Career Awards for Scientists and Engineers (PECASE), which are single investigator research efforts performed by outstanding academic scientists and engineers early in their research careers. This program provides the knowledge base, scientific concepts, and technological advances for the maintenance of Naval power and national security.

Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.

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PROGRAM CHANGE SUMMARY:

	FY 2004	FY 2005	FY 2006	FY 2007
FY 2005 President's Budget Submission	91,489	83,508	75,980	72,963
Cong Rescissions/Adjustments/Undist. Reductions	0	-879	0	0
Congressional Action	0	8,700	0	0
Non-Pay Inflation Adjustments	-85	0	0	0
Program Adjustments	0	-19	-70	-58
SBIR Assessment	-2,483	0	0	0
FY 2006/2007 President's Budget Submission	88,921	91,310	75,910	72,905

PROGRAM CHANGE SUMMARY EXPLANATION:
Technical: Not applicable.

Schedule: Not applicable.

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B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2004	FY 2005	FY 2006	FY 2007
MULTIDISCIPLINARY UNIVERSITY RESEARCH INITIATIVE (MURI)	48,788	58,466	58,156	46,991

Research efforts include high priority topics that intersect more than one traditional discipline. Multidisciplinary University Research Initiative (MURI) topics are selected to address high priority science and technology directions of the Department of the Navy, including the four ONR Grand Challenges (Naval

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Battlespace Awareness, Electric Power Sources for the Navy and Marine Corps, Naval Materials by Design, and Multifunctional Electronics for Intelligent Naval Sensors).

Fluctuations in the program value between fiscal years reflect the maturation of existing awards. MURIs are a 3-year grant award, with a 2-year executable option. The FY 2007 budget reflects the FY 2004 budget that contained only 6 FY04 new MURI awards, generating fewer out-year bills from MURI efforts. New awards in FY 2006 and FY 2007 will be kept at approximately 10-14 new awards, engaging the academic community robustly in basic research.

FY 2004 Accomplishments:

• A Broad Agency Announcement (BAA) was used to solicit proposals addressing five ONR high priority topics. Six research grants were awarded in response to proposals for the five ONR topics, and one grant was awarded in response to a proposal addressing the OSD topic of Laboratory Instrumentation Design. These awards were in the priority research areas of semiconductor materials, environmental modeling and prediction, electromagnetic launchers, missile propulsion technology, combat warrior survival, and power systems test and measurement. New MURI awards totaled $5,396K in FY 2004. $43,392K was spent to continue MURI projects begun in prior years.

FY 2005 Plans:

• Conduct competition for $5,500K of new MURI awards to address selected high priority Naval science and technology areas, transformational initiatives, and grand challenges, including strategically important DoD research areas. Ten topics have been identified for publication in a BAA to solicit proposals. These topics address interferometry, dielectric materials, materials processing, wavefield prediction, nanostructured materials, semiconductors for radio frequency sensors, river and estuarine flows, magnetic sensors, hypersonic materials, and machine language. $52,966K will be spent to continue MURI projects begun in prior years.

FY 2006 Plans:

• Conduct competition for $5,500K of new MURI awards to address selected high priority Naval science and technology areas, transformational initiatives, and grand challenges, including strategically important DoD research areas. About ten high priority research topics will be identified for publication in a BAA to solicit proposals. $52,656K will be spent to continue MURI projects begun in prior years.

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FY 2007 Plans:

• Conduct competition for $7,700K of new MURI awards to address selected high priority Naval science and technology areas, transformational initiatives, and grand challenges, including strategically important DoD research areas. About fourteen high priority research topics will be identified for publication in a BAA to solicit proposals. $39,291K will be spent to continue MURI projects begun in prior years.

	FY 2004	FY 2005	FY 2006	FY 2007
DEFENSE UNIVERSITY RESEARCH INSTRUMENTATION PROGRAM	18,123	17,186	16,705	24,865

Defense University Research Instrumentation Program (DURIP) funds are provided to universities to purchase relatively high cost research instrumentation that is normally not included in single-investigator type research grants. Individual grants range from $50,000 to $1,000,000, with awards averaging about $200,000.

FY 2005 Congressional program cut reduces competition from approximately 90 research instrumentation awards down to 72. FY 2006 and FY 2007 funding levels remain at approximately the same level as previous submission. This level of effort restores the DURIP program to previous levels and will provide robust support to on-going efforts. In addition, DURIP supports the DON overall corporate goal of continuing to emphasize the value and importance of basic research contributions. Restoring DURIP levels in FY 2007 represents the best value to the DON, when combined with the effort to increase anticipated MURI awards from 6 in FY 2004 to 14 in FY 2007.

FY 2004 Accomplishments:

• In response to the FY 2004 DURIP Broad Agency Announcement, 375 proposals requesting more than $100 million were submitted to ONR. Seventy six of these proposals were selected for an award.

FY 2005 Plans:

• Conduct competition for approximately 72 research instrumentation awards to universities.

FY 2006 Plans:

• Conduct competition for approximately 65 research instrumentation awards to universities.

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FY 2007 Plans:

- Conduct competition for approximately 95 research instrumentation awards to universities.

	FY 2004	FY 2005	FY 2006	FY 2007
PRESIDENTIAL EARLY CAREER AWARDS	1,000	1,100	1,049	1,049

Extremely prestigious, presidential-rank, single-investigator research awards in areas of importance to the Department of the Navy, to recognize and encourage outstanding academic scientists and engineers early in their research career. Presidential Early Career Awards for Scientists and Engineers (PECASE) awards are made by research agencies throughout the federal government. Awards provide national recognition and research grants of $100,000 per year for five years.

FY 2004 Accomplishments:

- Two outstanding university researchers were selected to receive the five-year PECASE research award to conduct research of importance to the Navy. Continued PECASE programs begun in earlier years.

FY 2005 Plans:

- Select two outstanding university researchers to receive the five-year PECASE research award to conduct research of importance to the Navy. Continue PECASE programs begun in earlier years.

FY 2006 Plans:

- Select two outstanding university researchers to receive the five-year PECASE research award to conduct research of importance to the Navy. Continue PECASE programs begun in earlier years.

FY 2007 Plans:

- Select two outstanding university researchers to receive the five-year PECASE research award to conduct research of importance to the Navy. Continue PECASE programs begun in earlier years.

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CONGRESSIONAL PLUS-UPS:

	FY 2004	FY 2005
ARMED FORCES FOOD SAFETY AND SECURITY RESEARCH	2,691	0

This funding supported efforts in food safety and security research for the armed forces.

	FY 2004	FY 2005
CENTER FOR MARITIME SYSTEMS	3,460	0

This effort developed a state of the art tow tank with enhanced measurement accuracy to improve knowledge of performance metrics of innovative hull forms to aid in the design of fast efficient ships without the need for extensive prototype testing.

	FY 2004	FY 2005
CENTER FOR MICROWAVE FERRITES AND MULTI-FUNCTIONAL INTEGRATED CIRCUITS	0	990

This effort supports basic research at the Center for Microwave Ferrites and Multi-functional Integrated Circuits.

	FY 2004	FY 2005
CENTER FOR SOUTHEASTERN TROPICAL ADVANCED REMOTE SENSING (CSTARS)	4,805	2,476

FY04: This effort developed a ground station to receive remote sensing data from commercial satellites to enhance the intelligence, surveillance, and reconnaissance mission of US SouthCom.
FY05: This effort supports scientific research in land, atmosphere, ice and ocean sciences, as well as more practical applications in the fields of environmental monitoring, natural hazard assessment, civil defense and defense tactical applications at the Center for Southeastern Tropical Advanced Remote Sensing.

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	FY 2004	FY 2005
DEFENSE COMMERCIALIZATION RESEARCH INITIATIVE	0	3,962

This effort supports the Defense Commercialization Research Initiative.

	FY 2004	FY 2005
LOW TEMPERATURE RESEARCH CENTER	961	0

This effort supported basic research into the properties of materials at very low temperatures.

	FY 2004	FY 2005
MEMS SENSOR FOR ROLLING ELEMENT BEARINGS	1,394	0

This effort supported development of a one-chip sensor solution for determining temperature, vibration, strain, and angular rotation in rolling element bearings.

	FY 2004	FY 2005
MULTIFUNCTIONAL MATERIALS FOR NAVAL STRUCTURES	0	1,585

This effort supports development of multifunctional materials for Naval structures.

	FY 2004	FY 2005
NANOMATERIALS FOR HIGH PERFORMANCE COATING APPLICATIONS	964	0

This effort supported basic research in the area of nanoparticle based coatings and thin films to aid in the development of coatings to improve marine hull fouling prevention, corrosion protection, stealth, and protection from chemical and biological weapons agents.

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	FY 2004	FY 2005
NANOPARTICLE MATERIALS RESEARCH	0	1,090

This effort supports nanoparticle materials research.

	FY 2004	FY 2005
NANOSCIENCE RESEARCH	2,890	1,485

FY04: This effort developed new concepts for improved materials, novel structures, and integrated, multifunctional materials and structures with potential dual use applications for homeland security.
FY05: This effort supports nanoscience research to overcome limitations that inhibit the fulfillment of nanomaterials' potential for widespread use in naval structures and sensors with potential dual use applications for homeland security.

	FY 2004	FY 2005
NATIONAL SECURITY TRAINING	0	990

This effort supports national security training.

	FY 2004	FY 2005
NEURAL ENGINEERING RESEARCH	961	990

FY04: This effort supported basic research in the area of human neural networks by employing microscale devices that allow real-time analyses of human brain nerve signals. This effort explored the feasibility of humans controlling autonomous devices via brain activity.
FY05: This effort supports neural engineering research.

	FY 2004	FY 2005
REMOTE SENSING RESEARCH	0	990

This effort supports remote sensing research.

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	FY 2004	FY 2005
SURA COASTAL OCEAN OBSERVATION PROGRAM (SCOOP)	2,884	0

This effort supported the development of a network of sensors and linked computers as part of the Southeastern Universities Research Association (SURA) Coastal Ocean Observing Program which will fully integrate several observing systems in the southern region. This network provides data, in real-time and at high speed, for more reliable, accurate, and timely information to help guide effective coastal stewardship, plan for extreme events, facilitate safe maritime operations, and support coastal military security.

C. OTHER PROGRAM FUNDING SUMMARY:
Not applicable.

D. ACQUISITION STRATEGY:
Not applicable.